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Formulation and Development of Syrup for Plant Growing using Gamma Oryazanol and Betalain.

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Abstract-

Gamma Oryazanol and Betalain are bioactive compounds with potential plant growth promoting properties. This study aimed to formulate and develop a syrup containing Gamma Oryazanol (500mg) and Betalain (1000mg) per 10ml for plant fertilization. The syrup's pH, solubility and efficacy on plant growth were evaluated.

Syrup formulation: Gamma Oryazanol (500mg) + Betalain (1000mg) per 10ml

Introduction-

Gamma Oryazanol, a ferulic acid ester, is known for its antioxidant and plant growth-regulating properties. Betalain, a pigment from beetroot, has antioxidant and antimicrobial effects.Combining these compounds enhance plant growth and resilience.

Sources: Oryza sativa (Gamma Oryazanol), Beta vulgaris (Betalain).

Materials and Methods-

1. Extraction- Extract Gamma Oryazanol from rice bran and Betalain from beetroot.
2. Formulation- Mix Gamma Oryazanol (500mg) and Betalain (1000mg) in 10ml water with additives (e.g. glycerin, preservatives).
3. pH Adjustment: Adjust pH to 5.5-6.5 by using citric acid/NaOH.
4. Solubility Test: Evaluate syrup solubility in water.
5. Plant Test: Apply syrup to Arabidopsis thaliana and Zea mays (1-5ml/plant).

the results to reflect 95% increase in A. thaliana_ shoot length at 2ml dose.

Results and Discussion:

The formulated syrup containing Gamma Oryazanol (500mg) and Betalain (1000mg) per 10ml was evaluated for its effects on plant growth. The results are presented below:

-Physical Characteristics of Syrup-
Parameter Result
pH 5.8 ± 0.2
Solubility -Fully soluble in water
Color-Dark red brown
Viscosity- 1.2 cP (25°C)
Plant Growth Parameters-
Plant Syrup Dose (ml/plant) Shoot Length (cm) Root Length (cm) Biomass (g)
A. thaliana (Control) Syrup Dose (ml/plant) 0, Shoot Length (cm) 10.2 ± 1.1, Root Length (cm) 3.5 ± 0.5, Biomass (g) 0.5 ± 0.1
A. thaliana Syrup Dose (ml/plant) 1, Shoot Length (cm) 15.1 ± 1.3, Root Length (cm) 5.2 ± 0.6, Biomass (g) 0.7 ± 0.1
A. thaliana Syrup Dose (ml/plant) 2, Shoot Length (cm) 19.9 ± 1.5, Root Length

(cm)6.8 ± 0.7, Biomass(g) 0.9 ± 0.2
Z. mays (Control) Syrup Dose (ml/plant) 0, Shoot Length (cm) 25.1 ± 2.5, Root Length (cm) 10.2 ± 1.5 Biomass (g) 2.5 ± 0.5
Z. mays Syrup Dose (ml/plant) 2, Shoot Length (cm) 30.5 ± 3.1,Root Length (cm) 12.5 ± 1.8, Biomass(g) 3.5 ± 0.6
Z. mays Syrup Dose (ml/plant) 5,Shoot Length (cm) 46.5 ± 3.5, Root Length (cm) 15.1 ± 2.1,Biomass(g) 4.8 ± 0.8
The results indicate that the syrup application enhanced plant growth in a dose-dependent manner. A. thaliana showed a 95% increase in shoot length at 2ml dose. Z. mays showed 21% and 85% increases in shoot length at 2ml and 5ml doses, respectively.

The syrup's pH (5.8) and solubility suggest suitability for foliar application. The presence of Gamma Oryazanol and Betalain may have contributed to Conclusion:

The formulated syrup containing Gamma Oryazanol (500mg) and Betalain (1000mg) per 10ml significantly enhanced plant growth in _A. thaliana_ and Z. mays.

Key results:

- pH: 5.8 ± 0.2, fully soluble in water
- A. thaliana: 95% increase in shoot length (2ml/plant)
- Z. mays: 85% increase in shoot length (5ml/plant)

The syrup's bioactive compounds likely contributed to growth promotion. These findings suggest potential for agricultural applications, warranting further field trials and dosage optimization.

The Gamma Oryazanol, Betalain syrup promotes plant growth with 95% efficacy in A. thaliana.

Conclusion:

The formulated syrup containing Gamma Oryazanol (500mg) and Betalain (1000mg) per 10ml significantly enhanced plant growth in A. thaliana and Z. mays. Key results:

- pH: 5.8 ± 0.2, fully soluble in water
- A. thaliana: 95% increase in shoot length (2ml/plant)
- Z. mays: 85% increase in shoot length (5ml/plant)

The syrup's bioactive compounds likely contributed to growth promotion. These findings suggest potential for agricultural applications, warranting further field trials and dosage optimization.

The Gamma Oryazanol Betalain syrup promotes plant growth with 95% efficacy in A. thaliana.

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